Programming
Merit Badge Workbook

This workbook can help you but you still need to read the merit badge pamphlet.
This Workbook can help you organize your thoughts as you prepare to meet with your merit badge counselor

Merit Badge Counselors may not require the use of this or any similar workbooks.
You still must satisfy your counselor that you can demonstrate each skill and have learned the information.
You should use the work space provided for each requirement to keep track of which requirements have been completed,
and to make notes for discussing the item with your counselor, not for providing full and complete answers.
If a requirement says that you must take an action using words such as "discuss", "show",
"tell", "explain", "demonstrate", "identify", etc, that is what you must do.
No one may add or subtract from the official requirements found on Scouting.org.

The requirements were last issued or revised in 2022   •   This workbook was updated in December 2022.

Scout's Name:_____   Unit: _____

Counselor's Name: _____   Phone No.:_____   Email: _____

> The Programming merit badge website, http://www.scoutlife.org/programming, provides information and resources that may assist you in completing the following requirements.

☐ **1. Safety.** - Do the following:

☐ a. Show your counselor your current, up-to-date Cyber Chip.

> ### Earn the Cyber Chip
>
> *Earning the Cyber Chip can help you learn how to stay safe while you are online and using social networks or the latest electronic gadgets. Topics include cell phone use, texting, blogging, gaming, cyberbullying, and identity theft. Find out more about the Cyber Chip at www.scouting.org/cyberchip.*

Note: A workbook for the Boy Scout Cyber Chip is attached at the end of this workbook.

☐ b. Discuss first aid and prevention for the types of injuries that could occur during programming activities, including repetitive stress injuries and eyestrain.

Eyestrain	
Repetitive Stress Injuries	

Other

2. **History.** - Do the following:

☐ a. Give a brief history of programming, including at least three milestones related to the advancement or development of programming.

☐ b. Discuss with your counselor the history of programming and the evolution of programming languages.

3. General knowledge. - Do the following:

☐ a. Create a list of five popular programming languages in use today and describe which industry or industries they are primarily used in and why.

	Language	Industry	Why is it used?
1.			
2.			
3.			
4.			
5.			

☐ b. Describe three different programmed devices you rely on every day.

1.	
2.	
3.	

4. Intellectual property. - Do the following:

☐ a. Explain the four types of intellectual property used to protect computer programs.

☐ b.   Describe the difference between licensing and owning software.

☐ c.   Describe the differences between freeware, open source, and commercial software, and why it is important to respect the terms of use of each.

5.   Projects. - Do the following:

☐ a.   With your counselor's approval, choose a sample program. Modify the code or add a function or subroutine to it. Debug and demonstrate the modified program to your counselor..

> *The Programming merit badge website, http://www.scoutlife.org/programming, has a number of sample programs that you could use for requirement 5a. However, you have the option of finding a program on your own. It's a good idea to seek your merit badge counselor's guidance.*

Language	
Environment	
Industry	
Program:	

☐ Modify the code or add a function or subprogram to it.

Modification:

☐ Debug and demonstrate the modified program

Debugging
performed

☐ Demonstrate the program

☐ b. With your counselor's approval, choose a second programming language and development environment, different from those used for requirement 5a and in a different industry from 5a. Then write, debug, and demonstrate a functioning program to your counselor, using that language and environment.

Language	
Environment	
Industry	
Program	
Debugging performed	

☐ Demonstrate the program

☐   c.   With your counselor's approval, choose a third programming language and development environment, different from those used for requirements 5a and 5b and in a different industry from 5a or 5b. Then write, debug, and demonstrate a functioning program to your counselor, using that language and environment.

Language	
Environment	
Industry	
Program	

Debugging performed	

☐   Demonstrate the program

☐ d. Explain how the programs you wrote for requirements 5a, 5b, and 5c process inputs, how they make decisions based on those inputs, and how they provide outputs based on the decision making.

6. **Careers.** - Find out about three career opportunities that require knowledge in programming.

1.

2.

3.

☐ Pick one and find out the education, training, and experience required.

Career

Education

Training

Experience

☐ Discuss this with your counselor and explain why this career might be of interest to you.

Scouts BSA Cyber Chip
Workbook

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completed, and to make notes for discussing the item with your counselor, not for providing full and complete answers.
If a requirement says that you must take an action using words such as "discuss", "show",
"tell", "explain", "demonstrate", "identify", etc, that is what you must do.
Merit Badge Counselors may not require the use of this or any similar workbooks.

No one may add or subtract from the official requirements found in Scouts BSA Requirements (Pub. 33216 – SKU 656269).

The requirements were last issued or revised in 2020   •   This workbook was updated in December 2022.

Scout's Name:_____   Unit: _____

Counselor's Name: _____   Phone No.:_____   Email: _____

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A. Cyber Chip Requirements for Grades 6-8

☐ 1.   Read and sign the Level II Internet Safety Pledge on the BSA Cyber Chip card. (BSA Cyber Chip green card; can be
ordered at www.scoutshop.org.)

Internet Safety Pledge
1.   I will think before I post
2.   I will respect other people online
3.   I will respect digital media ownership
4.   I won't meet face-to-face with anyone I meet in the digital world unless I have my parent's permission
5.   I will protect myself online.

☐ 2.   Write and sign a personalized contract with your parent or guardian that outlines rules for using the computer and mobile
devices, including what you can download, what you can post, and consequences for inappropriate use.

General comments	
What I can download	

	What I can post
Consequences for inappropriate use	

☐ 3. Watch the video "Friend or Fake" (www.nsteens.org/Videos/FriendOrFake), along with two additional videos of your choosing (www.nsteens.org/Videos/FriendOrFake) from the list below, to see how friends can help each other to stay safe online.

- Post to be Private (youtu.be/mBsoODqfQgA)
- Split Decisions (youtu.be/HLUv8DHt_R4)
- Two Kinds of Stupid (youtu.be/T6ulH2bWCnY)

	Video Name	Date Watched
☐	Friend or Fake?	
☐		
☐		

☐ 4. As an individual or with your patrol, use the EDGE method to teach internet safety rules, behavior, and "netiquette" to your troop or another patrol. You are encouraged to use any additional material and information you have researched. Each member of the patrol must have a role and present part of the lesson.

☐ 5. Discuss with your unit leader the acceptable standards and practices for using allowed electronic devices, such as phones and games, at your meetings and other Scouting events.

B. Cyber Chip Requirements for Grades 9-12

☐   1.   Read and sign the Level II Internet Safety Pledge on the BSA Cyber Chip card. (BSA Cyber Chip green card; can be ordered at www.scoutshop.org.)

Internet Safety Pledge
1.   I will think before I post
2.   I will respect other people online
3.   I will respect digital media ownership
4.   I won't meet face-to-face with anyone I meet in the digital world unless I have my parent's permission
5.   I will protect myself online.

☐   2.   Write and sign a personalized contract with your parent or guardian that outlines rules for using the computer and mobile devices, including what you can download, what you can post, and consequences for inappropriate use.

General comments	
What I can download	
What I can post	
Consequences for inappropriate use	

☐ 3. Discuss with your parents the benefits and potential dangers teenagers might experience when using social media.

☐   Give examples of each.

☐ 4. Watch three {of the following "Real-Life Story" videos (www.nsteens.org/videos.aspx?Brand=Real-Life-Stories) to learn the impact on teens.

- Friend or Fake? (youtu.be/Nb1zAY_cc8o)
- Post to be Private (youtu.be/mBsoODqfQgA)
- Split Decisions (youtu.be/HLUv8DHt_R4)
- Two Kinds of Stupid (youtu.be/T6ulH2bWCnY)

	Video Name	Date Watched
☐		
☐		
☐		

☐ 5. As an individual or patrol, use the EDGE method and the Student Project Kit www.missingkids.org/content/dam/netsmartz/downloadable/studentprojectkit/Student_Project_Kit_V1.5.pdf) to teach internet safety rules, behavior, and "netiquette" to your troop or another patrol. You are encouraged to use any additional material and information you have researched. Each member of the patrol must have a role and present part of the lesson.

☐ 6. Discuss with your unit leader the acceptable standards and practices for using allowed electronic devices such as phones and games at your meetings and other Scouting events.

Note: All Cyber Chips will expire annually. Each Scout will need to go to Netsmartz (www.netsmartz.org) and complete two new resources to recommit to net safety and netiquette. Then, with the unit leader, the Scout can add the new date to the Cyber Chip card or certificate.

When working on merit badges, Scouts and Scouters should be aware of some vital information in the current edition of the *Guide to Advancement* (BSA publication 33088). Important excerpts from that publication can be downloaded from http://usscouts.org/advance/docs/GTA-Excerpts-meritbadges.pdf.
You can download a complete copy of the *Guide to Advancement* from http://www.scouting.org/filestore/pdf/33088.pdf.